

INSTRUCTION MANUAL

JERROLD

Book File

JR

OB-ATED

MUL - TV ANTENNA SYSTEM

MOST ECONOMICAL MASTER ANTENNA INSTALLATION
FOR HIGHEST QUALITY TELEVISION RECEPTION

2 to 48 sets

For:

TV DEALER SHOWROOMS
SMALL APARTMENT HOUSES
GARDEN TYPE APARTMENTS
TOURIST CAMPS • MOTELS
CLUBS • LOUNGES



JERROLD

ELECTRONICS CORPORATION • 26th and Dickinson Streets • PHILADELPHIA, PA

WORLD'S LARGEST MANUFACTURER OF AMPLIFIED MASTER ANTENNA SYSTEMS

RESPONSE CURVES
JERROLD ALL-BAND AMPLIFIER
MODEL PB-213

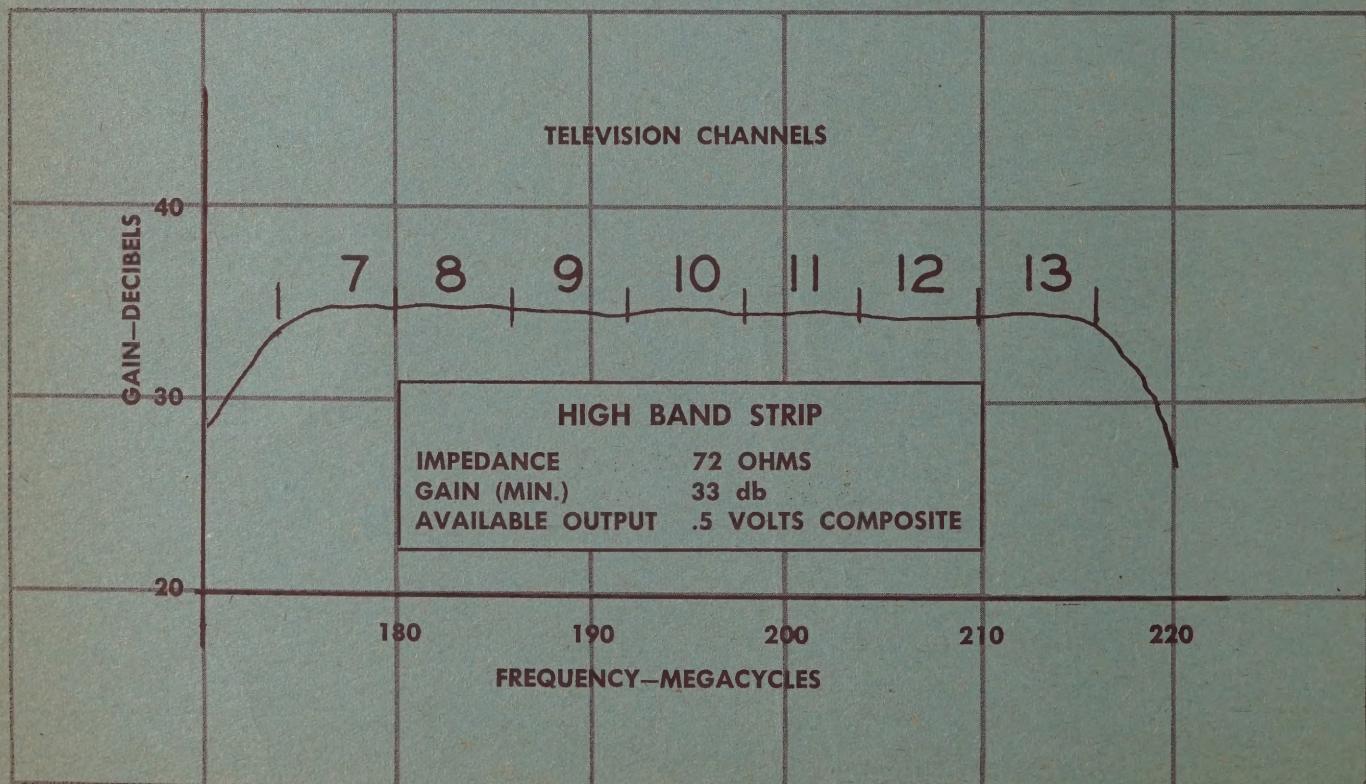
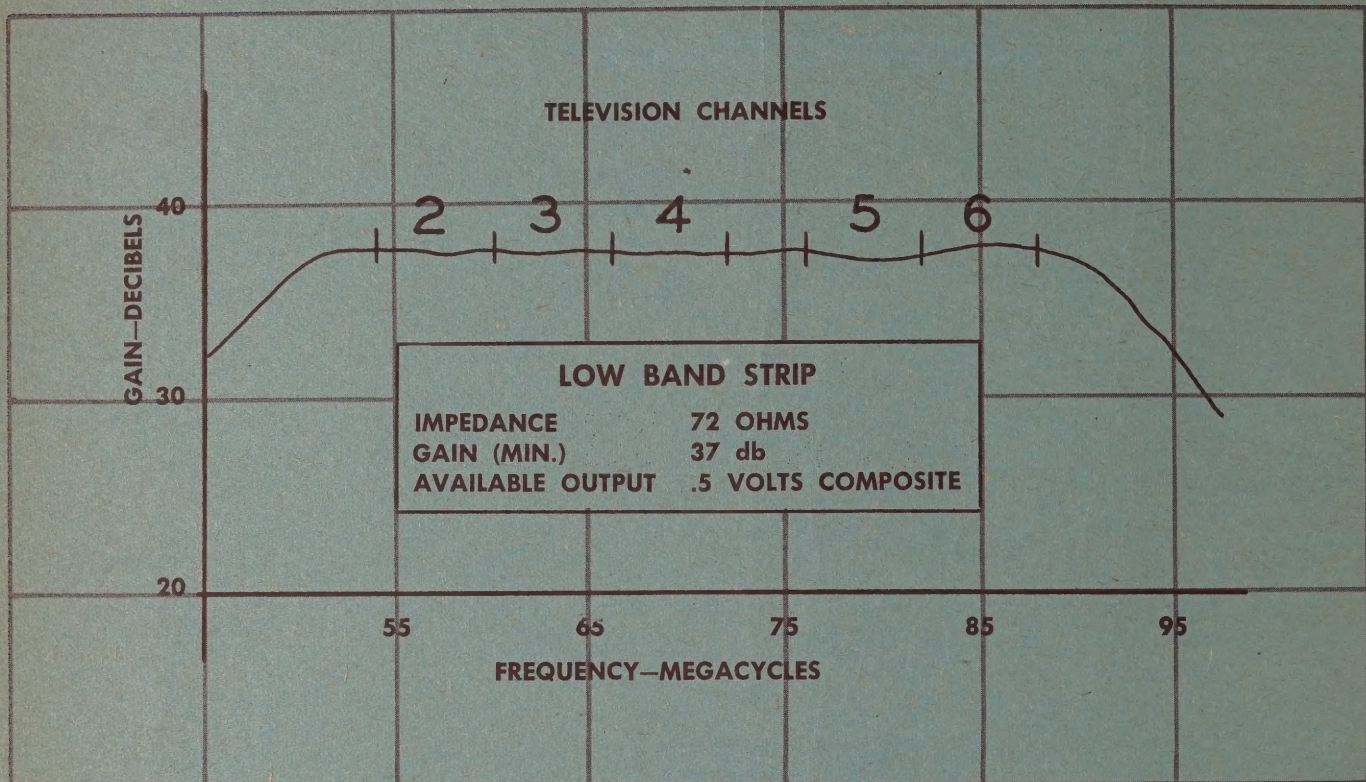


TABLE OF CONTENTS

GENERAL DESCRIPTION	2
TECHNICAL DESCRIPTION OF EQUIPMENT	5
AMPLIFIERS	5
ANTENNA MIXING NETWORKS.....	6
ANTENNA DISTRIBUTION OUTLET UNITS.....	7
RECEIVER ISOLATION NETWORKS.....	8
SYSTEM ACCESSORIES	9
ANTENNAS.....	10
INSTALLATION.....	12
GENERAL	12
1. STRONG SIGNAL AREAS (OVER 500 MICROVOLTS).....	12
2. WEAK SIGNAL AREAS (UNDER 500 MICROVOLTS.....	14
MOUNTING EQUIPMENT	16
WIRING MULTI-UNIT APARTMENT BUILDINGS.....	16
CONNECTING RECEIVERS TO SYSTEM.....	16
BALANCING AND ADJUSTING SYSTEM	18
MAINTENANCE PROBLEMS	19
SERVICING.....	20
APPENDIX A: CONSTRUCTING BALUNS	22
APPENDIX B: ELIMINATING INTERFERENCE	22
APPENDIX C: CONNECTING TRANSFORMERLESS (AC-DC)	
RECEIVERS TO SYSTEM	23
APPENDIX D: INSTALLING A 1402G RECEIVER ISOLATION UNIT.....	24

GENERAL DESCRIPTION

The **Jerrold J-R** System is an economical means of distributing amplified television signals to as many as 48 separate TV receivers in dealers' display rooms, small garden-type apartment projects, and small apartment buildings. It achieves the same high quality reception that its big brother, the JERROLD CL System provides for large master antenna installations.

Sensational new LOW BAND and HIGH BAND amplifiers are featured in the **Jerrold J-R** System in conjunction with distribution amplifiers (ADO units), isolation networks, and other accessories described in this manual.

A remarkable new circuit design enables the **Jerrold J-R** System to achieve a very low noise figure, permitting good reception in signal areas as low as 100 microvolts. Versatile amplifier input circuits (AMN's) permit choice of the most economical and efficient antenna installation for each system. Using the AMN units with the PB-213 Broad Band Amplifier makes it possible to obtain individual control of gain for each channel ordinarily achieved only with individual channel amplifier strips.

Present day receivers will not become obsolete, nor will they require costly changes when UHF stations begin operation. The **Jerrold J-R** System makes provision for a converter which will change any UHF channel to an unused VHF channel which may be received by existing sets.

The **Jerrold J-R** System will receive color broadcasts. The reception afforded by the All-Band Amplifier will be superior to that obtained by individual antennas.

A modern, aggressive, sales-minded dealer is assured that he will have clean, sharp pictures to help him sell TV receivers quickly and easily.

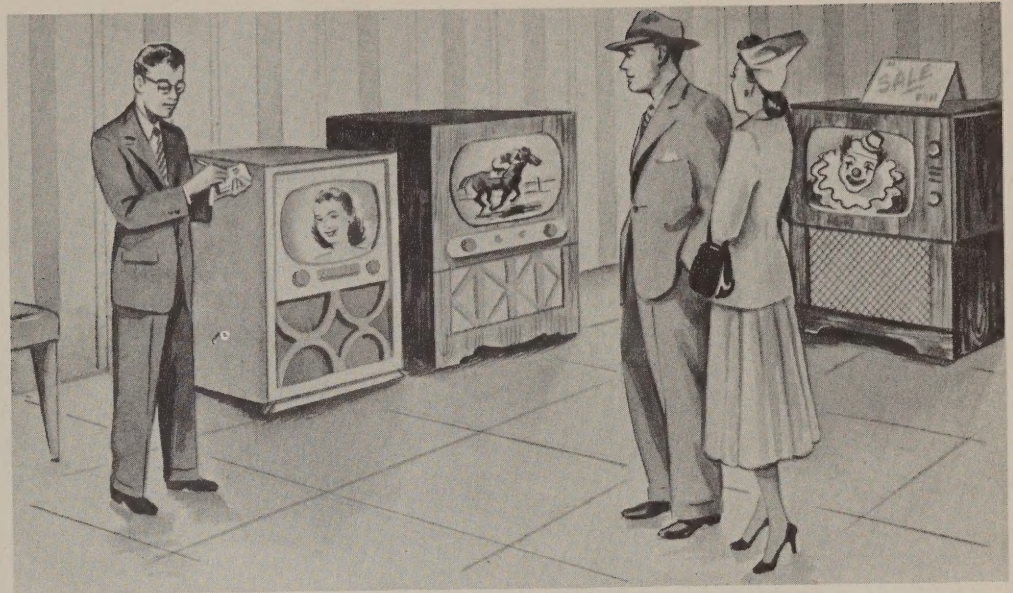
Every set on the dealer's floor may be demonstrated at peak performance. Confusing manipulation of controls by customers is eliminated. The customer's attention is concentrated on fine pictures of uniform quality. Salesmen's efforts are more effective and—MORE PROFITABLE.

A **Jerrold J-R** Antenna System is the perfect answer to the needs of the small apartment house owner and tenants of buildings from 2 to 48 units. *The Jerrold CL System is the most economical installation in buildings having more than 48 units.*

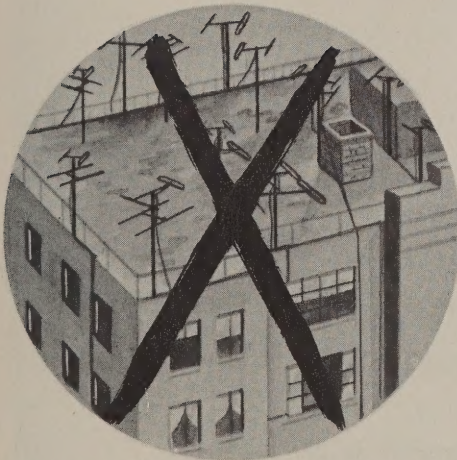
The tenant can enjoy perfect television reception on all channels without the bother of installing his own antenna, tower, rotor, or booster, which are cumbersome, costly, and difficult to maintain. The building owner enjoys a competitive advantage over other owners by satisfying tenant demands for good TV reception.

THE **Jerrold J-R** MUL-TV SYSTEM IS ENGINEERED TO ASSURE THE MOST ECONOMICAL INSTALLATION CONSISTENT WITH HIGH QUALITY SIGNAL DISTRIBUTION.

**DEALERS WHO SELL THE PICTURE
SELL MORE TELEVISION SETS**

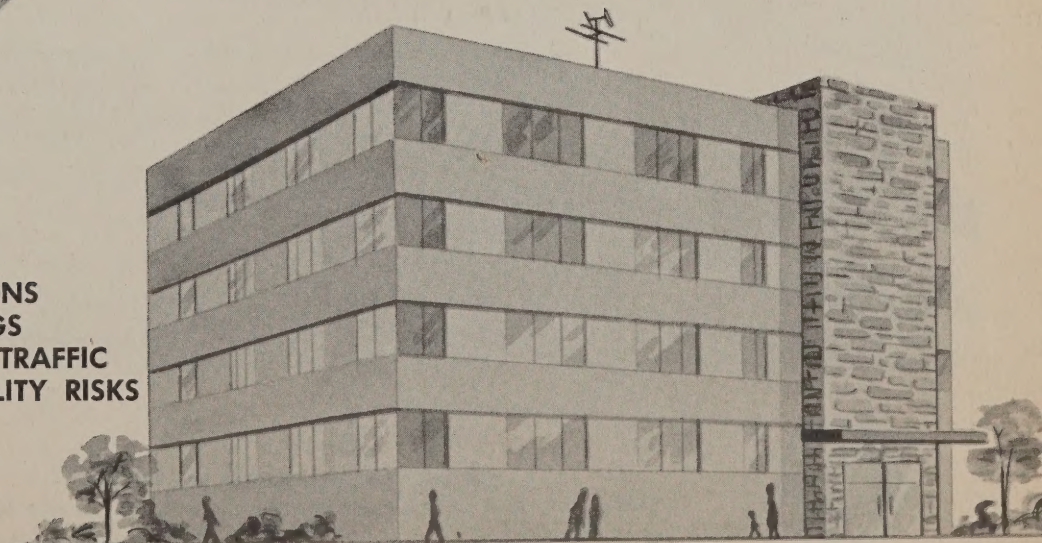


**NO CUSTOMER WAITING
NO ANTENNA SWITCHING
NO APOLOGIES FOR "POOR" PICTURES
NO "WALKOUTS"**



**ANTENNA JUNGLES ELIMINATED
FROM APARTMENT HOUSE ROOFS**

**NO ROOF DAMAGE
NO FIRE CODE VIOLATIONS
NO UNSIGHTLY BUILDINGS
NO UNDESIRABLE ROOF TRAFFIC
REDUCES OWNER'S LIABILITY RISKS**



THE JERROLD **JR** OB. ATED AMPLIFIERS

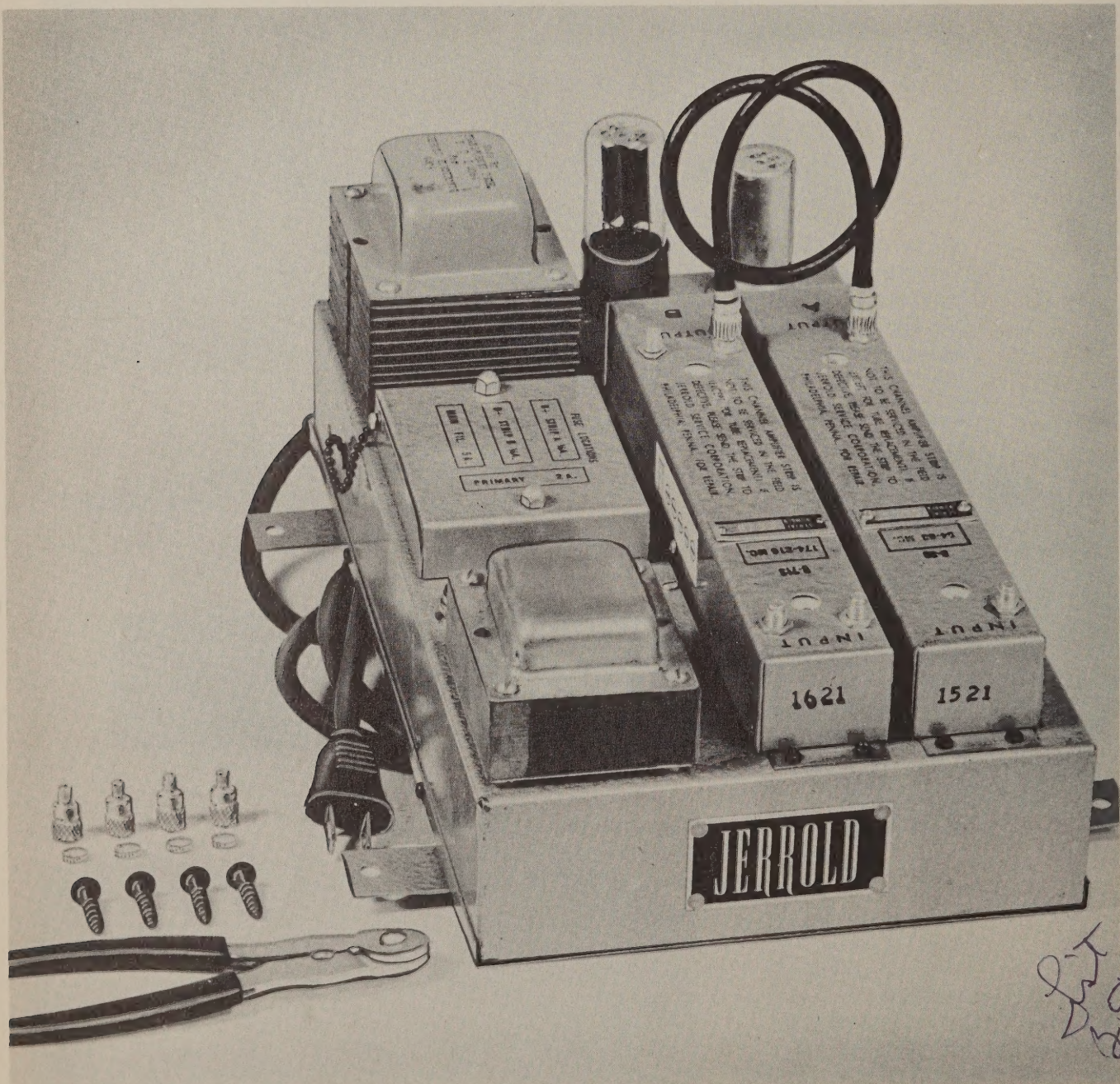


Figure 1

Model PB-213—ALL BAND AMPLIFIER

Contains a Low Band and High Band amplifier strip covering channels 2 thru 13.

NOTE: Coaxial cable fittings Model C-52 and crimping tool Model PL-52 furnished with amplifier.

TECHNICAL DESCRIPTION OF EQUIPMENT

AMPLIFIERS

There are three models of broad band amplifiers available for use in the **Jerrold J-R** System:

Model PB-213—All Band Amplifier

Model PB-26—Low Band Amplifier (54-88MC)

Model PB-713—High Band Amplifier (174-216MC)

IMPEDANCE. Both Strips = 72 ohms

MINIMUM GAIN SPECIFICATIONS. Low Band exceeds 37 db, (voltage gain 70 times). Response curve flat $\pm 1\frac{1}{2}$ db across 54-88 mc band. (Refer to graph on inside cover.)

High band exceeds 33 db, (voltage gain 45 times). Response curve flat $\pm 1\frac{1}{2}$ db across 174-216 mc band.

RATED MAXIMUM OUTPUT VOLTAGE. Each amplifier strip, high and low, is capable of delivering 0.5 volt rms composite signal (1.4 volt peak-to-peak). When an amplifier strip is operated with two or more channels, the cross-modulation level will limit the maximum output signal per channel to approximately 0.2 volts rms.

RATED MAXIMUM INPUT. The recommended input levels *per channel* to achieve maximum rated outputs are:

Low Band—7,000 uv. single channel

2,000 uv. multi-channel

High Band—10,000 uv. single channel

4,000 uv. multi-channel

NOISE FIGURE. Low Band Strip: 8 db

High Band Strip: 10 db

Maximum Noise Figure at any frequency in the band. (These low noise figures are far better than those of any other broad-band TV amplifier.)

TUBE COMPLEMENT.

Low Band Strip (54-88 mc)

6BQ7 Input (Low noise dual triode)

6CB6 } Intermediate, double-tuned

6CB6 } Double-tuned, matched output

High Band Strip (174-216 mc)

6BQ7 Input (Low noise dual triode)

6AK5 } Intermediate, double-tuned

6AK5 } Double-tuned, matched output

CABLE FITTINGS. Designed for use with RG 59/U fittings. Special adapters (Jerrold Model C-101) are available for use with RG 11/U cable.

FUSE PROTECTION. Four separate fuses protect the following circuits:

B + Low Band Strip, $\frac{1}{8}$ amp

B + High Band Strip, $\frac{1}{8}$ amp

Filament for both strips, 5 amps

A.C. Primary, 2 amps

SIZE AND WEIGHT. The PB-213 unit weighs 16½ lbs. (shipping weight), and is 13" x 10" x 5½". The unit is designed for either horizontal or vertical mounting.

POWER REQUIREMENTS.

PB-213—115 volts AC—50-60 cps—70 watts

PB-26 —115 volts AC—50-60 cps—50 watts

PB-713—115 volts AC—50-60 cps—50 watts

Underwriters Listing: E20666



All fittings and hardware for mounting are furnished with equipment.

ANTENNA MIXING NETWORKS

The AMN units greatly increase the flexibility and versatility of the **Jerrold J-R** System. By permitting the use of individual, cut-to-channel antennas, they enable the **Jerrold J-R** System to be used in many locations where heretofore only individual channel amplifiers could be used. The output level of each channel may be controlled independently by use of PD pads in antenna down leads. A constant ratio of output levels for

all channels can thus be maintained, and uniformity of reception achieved, even in areas where the signal levels of different stations vary greatly.

The AMN units are also used wherever individual antennas are needed to provide extra gain or ghost elimination.

The AMN units mount directly on top of their respective amplifier strips. Simply insert the mounting bracket beneath two screws in the cover of the strip.

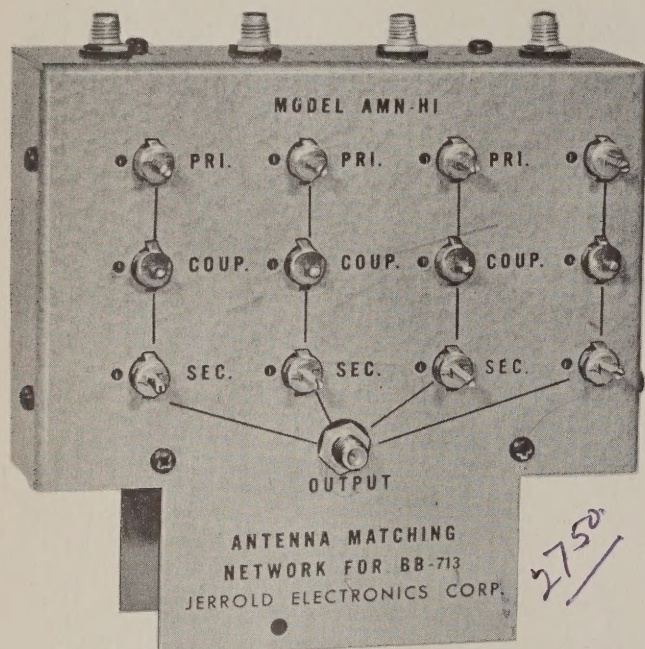


Figure 2
Model AMN-Hi

AMN-Hi. For High Channels 7 to 13. A low-loss (less than 1.0 db) Antenna Mixing Network which permits as many as four individual cut-to-channel antennas to feed into a single input. Each input and output is tuned for 72 ohms.

AMN-Lo. For Low Channels 2 to 6. A low-loss (less than 0.5 db) Antenna Mixing Network which permits as many as three, individual, cut-to-channel antennas to feed into a single input. Each input and output is tuned for 72 ohms.

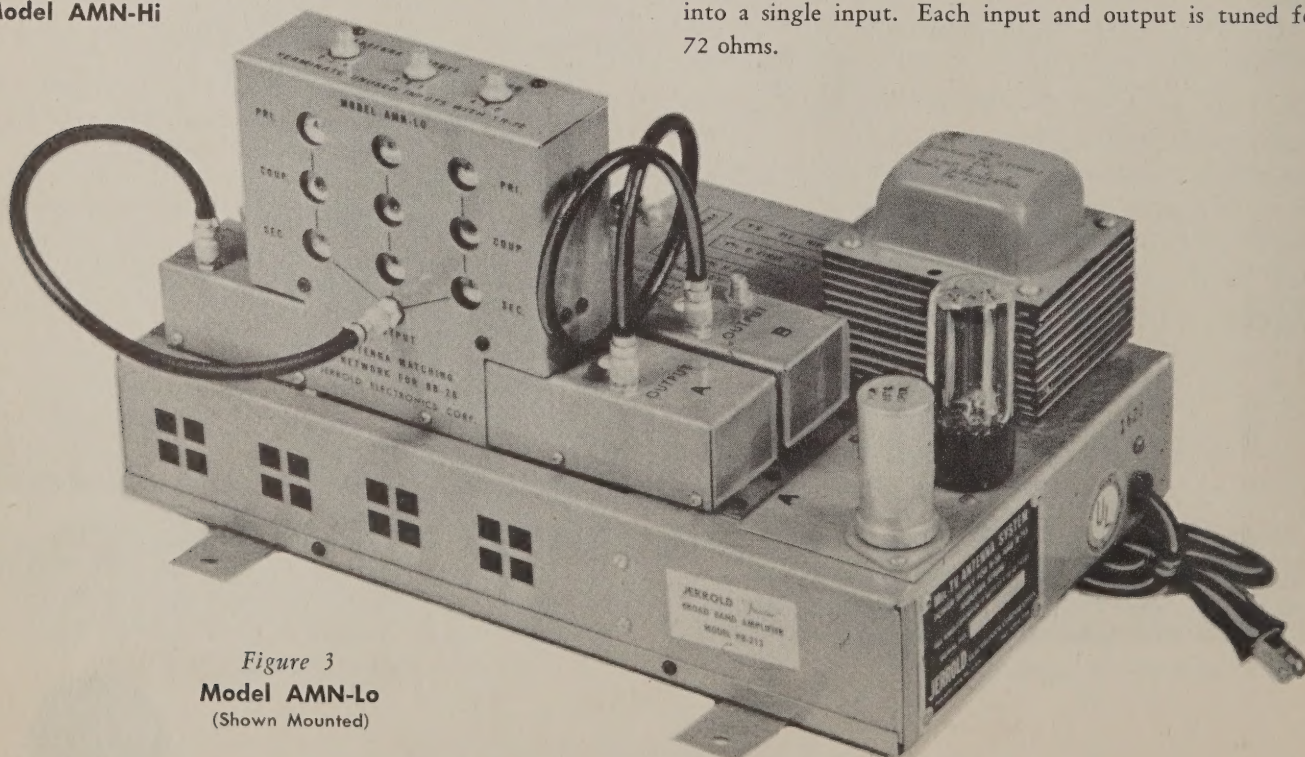


Figure 3
Model AMN-Lo
(Shown Mounted)

All fittings and hardware for mounting are furnished with equipment.

ANTENNA DISTRIBUTION OUTLET UNITS

Two models of Distribution Units are available:

Model ADO-3 —Three (3) outlets

Model ADO-10—Ten (10) outlets

These are new, improved, line-bridging amplifiers which provide a *Low-loss* method of electronic decoupling. These units perform the triple functions of:

1. Isolating TV receivers from the All-Band amplifier output.
2. Splitting the signal from the amplifier output into a desired number of separate riser cables, without appreciable signal loss.
3. Providing a minimum of 54 db of isolation between riser cables.

The forward signal loss on any channel is approximately 3 db. Backward attenuation exceeds 54 db for every

channel. ADO units are capable of handling maximum input signals for each channel of 200,000 microvolts without overloading or cross-modulating.

IMPEDANCE. 72 ohms main input and output; 72 ohms to feeder outputs.

CABLE FITTINGS. Designed for RG 59/U fittings. Special adapters are available for use with RG 11/U cable (Jerrold Model C-101).

POWER REQUIREMENTS. ADO-3: 25 Watts

ADO-10: 75 Watts

SIZE: ADO-3: 8" x 6 $\frac{3}{8}$ " x 3 $\frac{1}{2}$ "

ADO-10: 13 $\frac{1}{8}$ " x 9-7/16" x 5 $\frac{3}{8}$ "

WEIGHT: ADO-3: 5 lbs., Shipping Weight

ADO-10: 15 lbs., Shipping Weight

Underwriters Listing: E20666

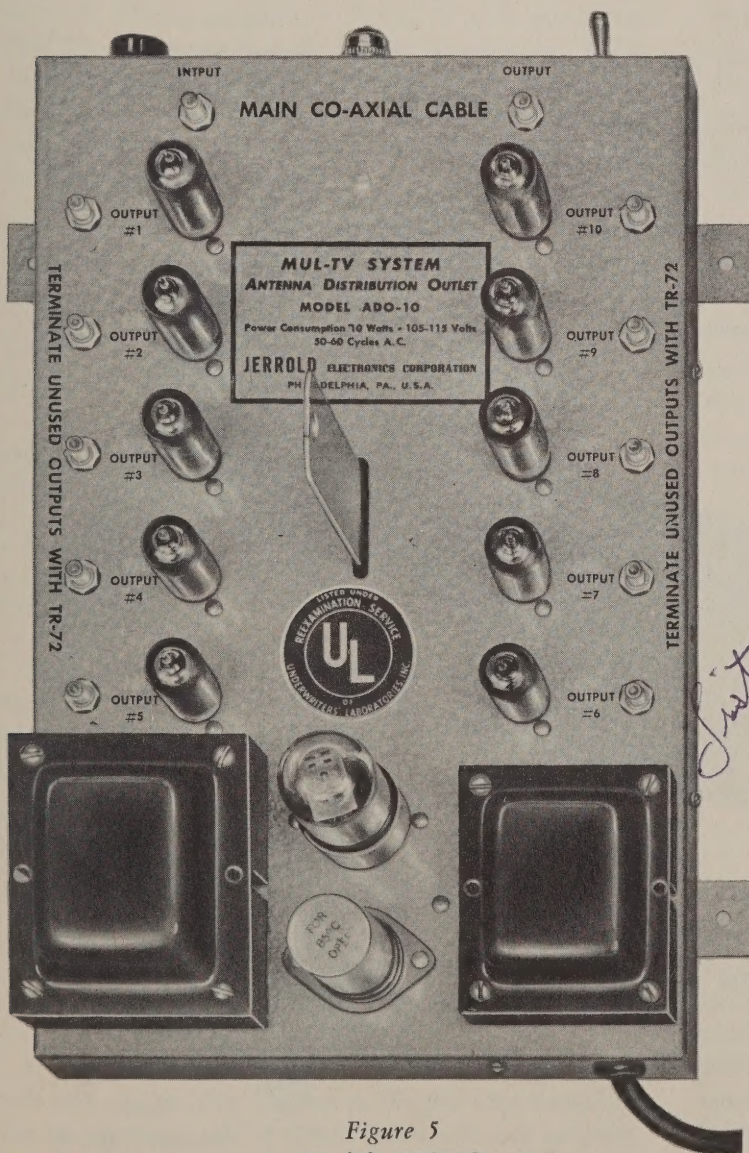


Figure 5
Model ADO-10

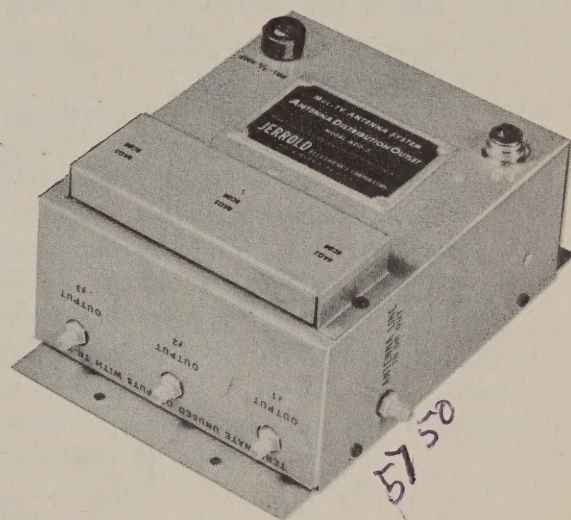


Figure 4
Model ADO-3

All fittings and hardware for mounting are furnished with equipment.

RECEIVER ISOLATION NETWORKS

Models: 1401-G 1402-G 1404-G 1404-XG
1401-T 1402-T

These non-resistive attenuator networks connect into the output feeder cables of ADO units linking individual receivers to the system. There is no power lost in these networks. They afford isolation of each receiver from the riser—a minimum of 10 db on the high channels, 20 db on the low channels, and twice as much isolation between adjacent receivers.

1401-G single outlet, surface mounting	} for RG 59/U Cable
1401-T single outlet, surface mounting	
1402-G single outlet, fits into 4x4 conduit box	
1402-T single outlet, fits into 4x4 conduit box	
1404-G four outlets, surface mounting	

1404-XG four outlets, surface mounting—for RG 11/U feed thru.

The 1401-T and 1402-T are isolation networks with 72 ohm Terminating Resistors for use at the ends of feeder lines. The 1402-G units are designed to fit into any standard electrical outlet box, preferably a 4x4 with a plaster cover. It is furnished with a tamper-proof plate and rivet assembly that protects the outlet against an illegal connection. (See Appendix D for complete instructions on making a tamper-proof installation.)

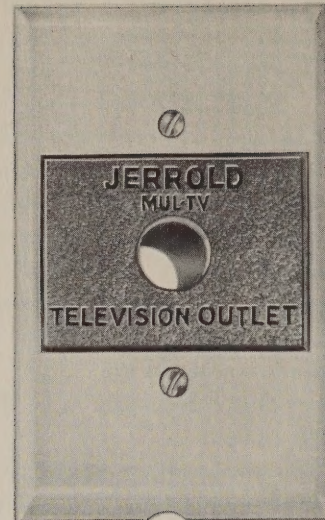


Figure 6
Model 1402-P,
COVER PLATE (Ivory)

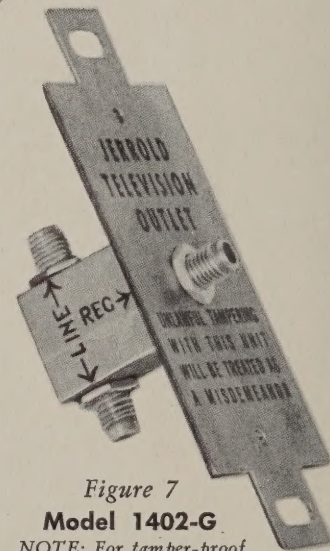


Figure 7
Model 1402-G
NOTE: For tamper-proof
installation, see Appendix D.

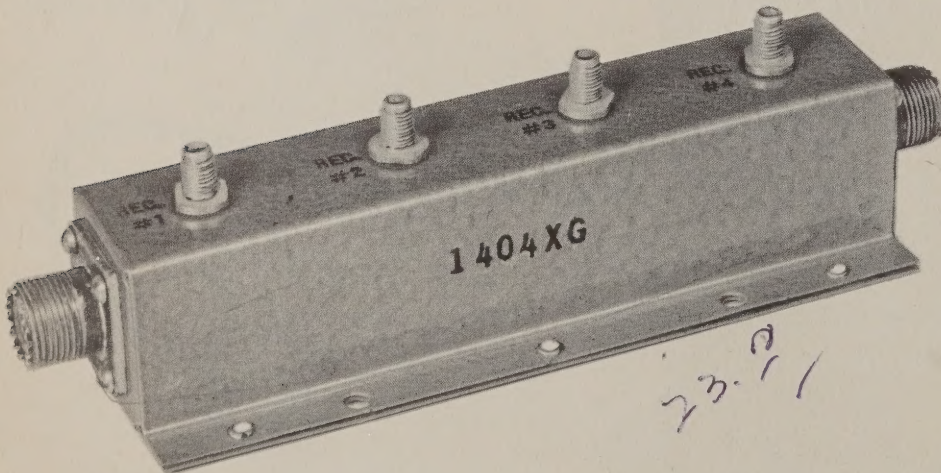


Figure 8
Model 1404-XG

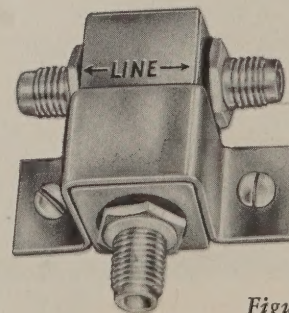


Figure 9
Model 1401-G

All fittings and hardware for mounting are furnished with equipment.

SYSTEM ACCESSORIES

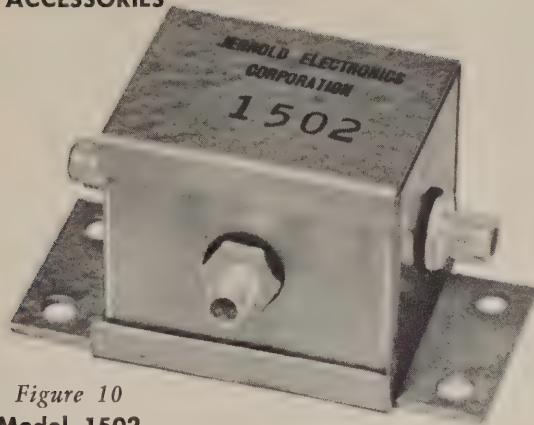


Figure 10
Model 1502

MODEL 1502 LINE SPLITTER. This is a symmetrical, resistive, splitting network with one 72 ohm input and two 72 ohm outputs. Each output is attenuated 6 db from the input. The splitter may be used to advantage in a **Jerrold J-R** System where it is necessary to provide two outputs from the All-Band Amplifier and the 6 db loss can be tolerated.

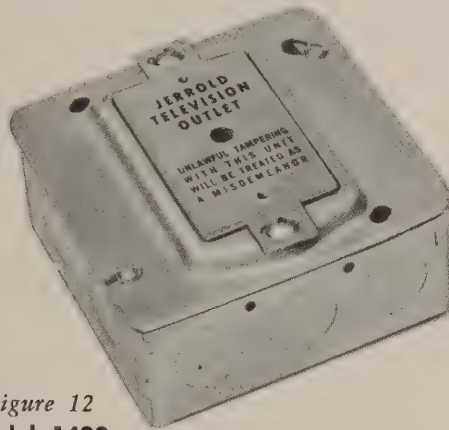


Figure 12
Model 1423

JERROLD TV OUTLET GUARD PLATE, MODEL 1423, AND BLIND RIVETS, MODEL 1421. The Model 1423 Guard Plate is used to prevent illegal tampering with the system when the risers are installed in conduit. The guard plate is riveted to the 4x4 outlet box and protects the riser cable from malicious damage to the system. (See Appendix D.)

MATCHING TRANSFORMERS 300-72 ohm (Two models are available):

Model T-30072 matches a balanced 300 ohm line to an unbalanced 72 ohm coaxial cable efficiently over the entire 50-220 MC band.

Model TS-300 is furnished with a 20" piece of shielded twin lead (ATV-225) attached to the 300 ohm terminals. The unit is thoroughly shielded. It is specifically designed for use in connecting 72 ohm co-ax directly to the tuners of TV receivers to overcome local pick-up problems.

All fittings and hardware for mounting are furnished with equipment.

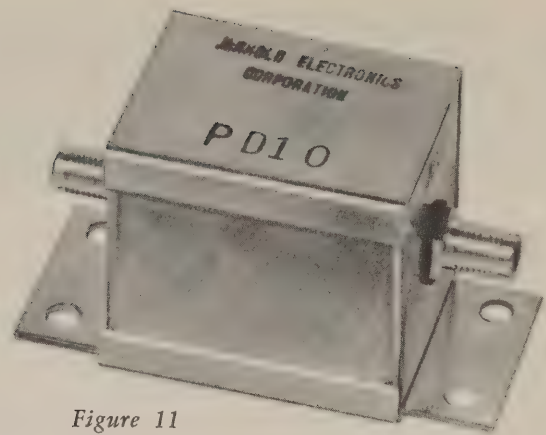


Figure 11
Model PD-10

ATTENUATOR PADS, MODELS PD-3, PD-6, PD-10, PD-20, PD-30. These pads are precision RF attenuator networks, providing a fixed attenuation in any 72 ohm line of 3, 6, 10, 20, or 30 db. They are used in the inputs of the Broad Band Amplifiers to balance the input levels of different channels, and to prevent amplifier overload and/or cross modulation.

VINYL TAPE, JERROLD ITEM No. 330. The vinyl tape supplied by Jerrold exhibits high adhesion and resistance to corrosion effects. It remains flexible under temperature extremes and is the recommended covering for all outdoor coaxial cable splices.

POLY TAPE, JERROLD ITEM No. 331. A high dielectric RF tape for use in place of the polyethylene removed in splicing coaxial cables. It applies easily in all weather and fuses rapidly into a solid mass, providing excellent resistance to corrosion of the splice.

JERROLD WEATHERPROOFING COMPOUND, TYPE 2100. This compound, especially developed for Jerrold, is used on fittings, antenna terminals, and 1401 isolation units, etc., which are exposed to outside weather conditions. The compound is applied in one coat with a stiff brush, and by a cold vulcanization process, provides moisture and corrosion protection to the object. The coating forms a film over the surface of fittings which peels off easily when a fitting must be removed. It is furnished in 1/2 pint cans with a stiff brush.

ANTENNAS

The **Jerrold J-R** System achieves the most economical and efficient use of antennas through its flexible input arrangements.

ALL-BAND ANTENNAS

In areas where all channels are ghost-free and approximately equal in signal strength, an all-band antenna may be used effectively. (See Figure 13.)

Since the All-Band Amplifier input impedance is 72 ohms, a 72 ohm antenna may be used directly with RG 59/U or RG 11/U cable. If a 300 ohm antenna is used, a 300-72 ohm matching transformer must be used between the antenna and amplifier input. (Jerrold Transformer Model T-30072)

When a matching transformer is used, it is recommended that it be placed near the antenna and co-ax run to the amplifier. If 300 ohm line has already been installed, the matching transformer may be used near the amplifier; provided that all open line be at least twenty-five (25)

feet away from the amplifier, to prevent feed-back. Co-ax should be run the remaining 25 feet.

The antenna lead is connected to either input fitting on the High Band strip. To couple the High and Low Band strips to a single antenna lead-in, cut a piece of RG 59/U cable *exactly* twenty (20) inches long for use as the *input* coupler link, and put Jerrold Model C-52 fittings on each end of this link. The *output* coupler link is a piece of RG 59/U cut 17¼" long and is furnished with the amplifier.

The output cable from the amplifier is taken from the High Band strip, as shown. A broad-band antenna should be used *only* in areas where successful operation with broad-band antennas has been proven.

Figure 13
ALL BAND ANTENNA

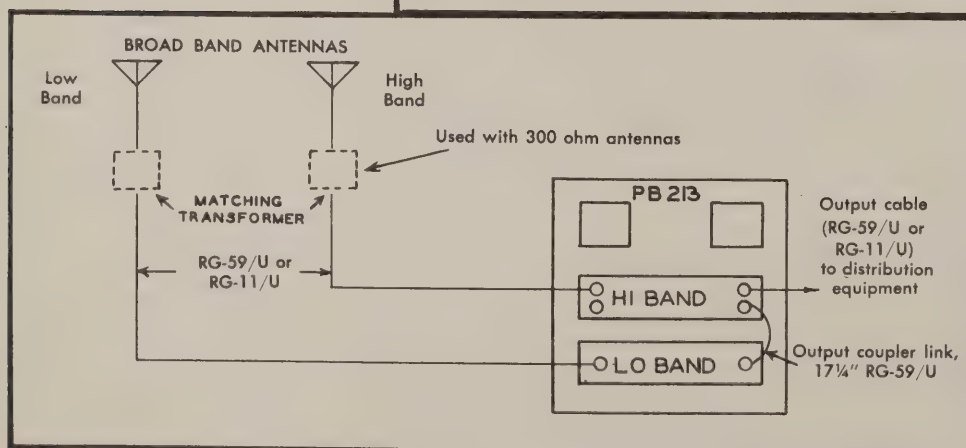
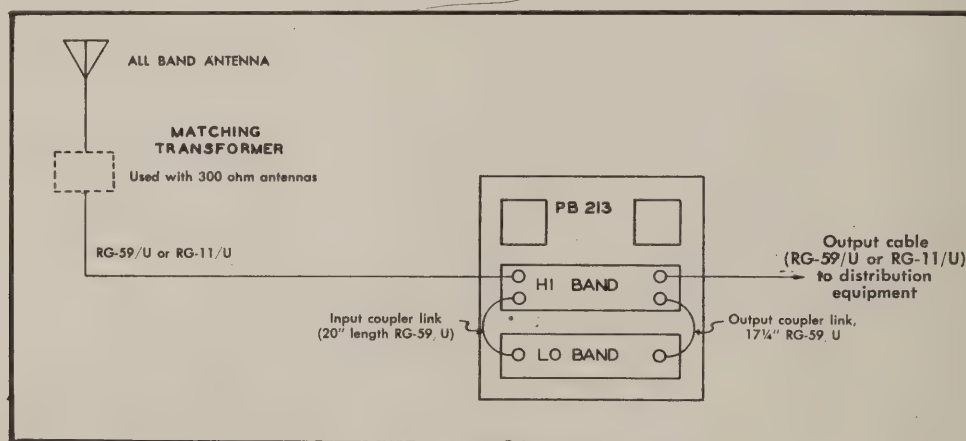


Figure 14
SEPARATE HIGH AND
LOW BAND ANTENNAS

SEPARATE HIGH AND LOW BAND ANTENNAS

In some locations it is necessary to have one antenna for the Low Bands and another for the High Bands, in order to equalize variations in signal strength. This type installation is shown in Figure 14.

Here the same technique for connecting the antennas to the amplifier is used, except that the input coupler is eliminated.

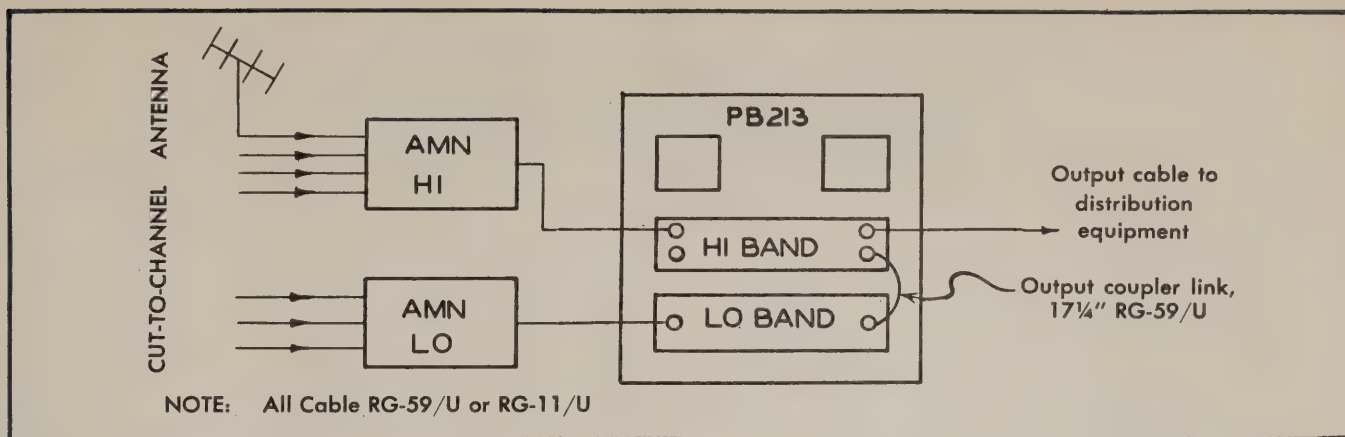


Figure 15
CUT-TO-CHANNEL ANTENNAS

SINGLE CHANNEL ANTENNAS

Where signals are extremely weak, where ghost reflections are prevalent, or where there are extreme variations in the signal strengths of various channels, it may be necessary to use individual, cut-to-channel antennas (Yagis, etc.) to bring in clear pictures. In these situations the AMN-Hi and the AMN-Lo are used as shown in Figure 15.

Jerrold Model J series of antennas, either single or double-stacked, are recommended for use in most areas. In weak fringe applications, multi-element (8, 10) Yagi antennas have been found extremely effective.

When 300 ohm antennas are used, a 300-72 ohm matching transformer must be used, or a "balun" constructed. (See Appendix A for construction details on baluns.)

Each antenna is oriented for greatest gain and minimum ghost. Antenna leads are fed into respective AMN-Hi and AMN-Lo (Antenna Mixing) Networks.

In areas where antenna signals exceed Rated Maximum Input (see page 5), or where there is a great variation in the antenna signals of different channels, a properly valued Jerrold PD Pad (3, 6, 10, 20, or 30 db) should be inserted in the antenna down-lead to balance the input

signals and prevent cross-modulation or overload of the amplifier strip.

In strong signal areas, pad down all inputs below Rated Maximum Input for each channel. Where some signals are strong and some are weak, it will be necessary to pad the strong signals sufficiently to eliminate cross-modulation. A convenient, easy method for determining the value of proper PD pad is to use the Jerrold Model A-72 RF Attenuator, and switch in different values of attenuation. The signal levels may be adjusted quickly and the proper value PD pad determined accurately.

Figure No. 16 shows a combination of broad band and cut-to-channel antennas.

One of the features of the **Jerrold J-R** System is thus apparent: *The most economical type of antenna may be used with the system in order to produce the desired results.*

In areas where FM transmission or other signals interfere with reception, the use of stubs or traps is necessary. (See Appendix B for information on eliminating interference.)

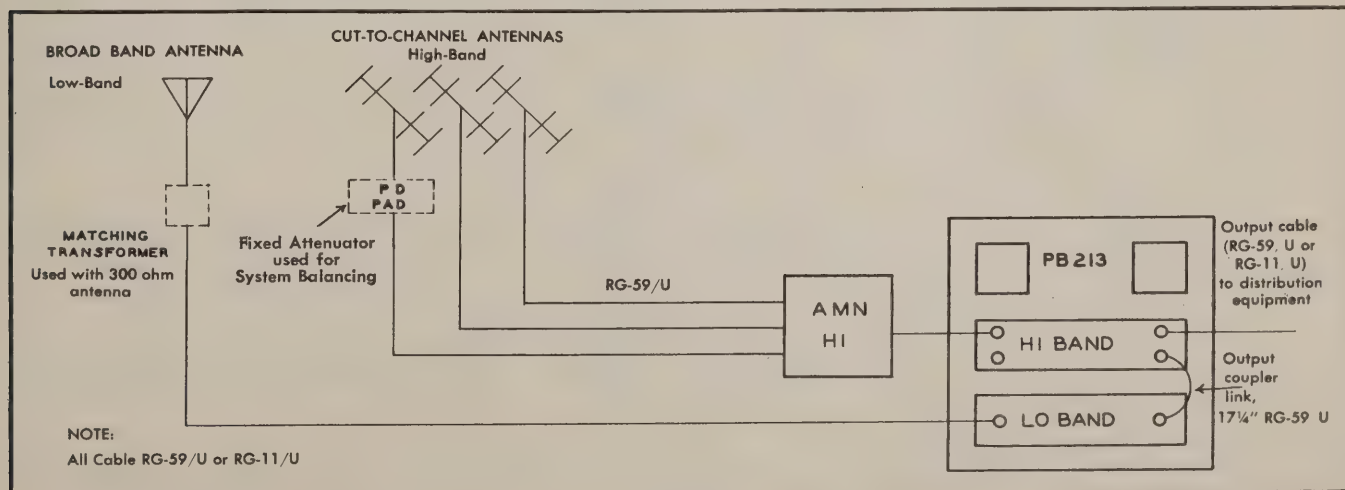


Figure 16
COMBINATION OF BROAD BAND AND SINGLE CHANNEL ANTENNAS

GENERAL

Before planning a **Jerrold J-R** System layout, a study should be made of the building plans or sketches. A survey of existing signal strengths is also required. The

The Jerrold Field Strength Meter Model 704 is a very accurate meter for this purpose.

Figure 17 shows a system adaptable to either a dealer's store or to a garden type apartment. Distribution of signal to the receivers is accomplished by using Jerrold 1404G or 1404XG units. The 1404G units are used with RG 59/U and the 1404XG with RG 11/U. In a store, these units mount on a wall surface at a convenient height, and are spaced to accommodate any grouping of receivers in floor demonstration or service shop areas. In garden type projects, the 1404G or 1404XG units are mounted in the attics or basements of the buildings, and cables run from there to each apartment.



In small dealer stores, where a maximum of 16 sets are to be connected within the maximum allowable cable length, the output of the All-Band Amplifier may be run directly to the 1404G or 1404XG units, preferably through a 6 db pad (Model PD-6) to provide the best impedance match for the equipment.

The 1401G method of distribution may also be applied to some garden type projects in place of, or to supplement, the 1404G method. Where the physical arrangement of the buildings requires a central location of the isolation network units, the 1404G method of distribution is more practical. If 5 or 6 apartments must be connected, 1401G units may be used in addition to the 1404G units. In cases where the Receiver Isolation units may be located physically near the receivers, the 1401G method will effect cable economy.



The output of the All-Band Amplifier is fed into ADO-3 or ADO-10 distribution outlet units to provide sufficient feeder lines to supply all receivers connected to the 1401G or 1402G isolation units. One, two or three ADO-3 units may be used to provide from three (3) to nine (9) outlets; or one ADO-10 to provide ten (10) outlets.

The method shown in Figure 19 applies generally to large dealers' stores, where receivers are grouped in different parts of a store, or to garden type apartments. This method also applies to a small apartment house where the ADO-3 units are to be located at several points around the building. The output of the All-Band Amplifier is fed into the 1502 line splitter. This unit provides two outputs to the ADO-3 units (each output of the 1502 is attenuated 6 db —50% of the input voltage).

The method shown in Figure 20 generally applies to dealers' stores where location of TV receivers falls into one or two groups with four to twenty receivers in each group. This method also applies to small apartment houses where the ADO-10 units are located at one or two points in the building with all lines to the receivers emanating from these locations.

When using ADO units in weak signal areas observe these rules:

1. Each outlet of an ADO-3 or ADO-10 shall feed one TV receiver by means of 72 ohm coaxial cable.

2. In order to obtain proper signal levels at the end of the line, the maximum cable lengths to any receiver from the amplifier should not exceed 150 feet if RG 59/U cable is used between ADO units, and 300 feet if RG 11/U cable is used between ADO units.

3. It is extremely important that the output terminal of the last ADO be terminated with the Jerrold TR-72 Terminating Resistor to prevent standing waves along the line. *All* unused outlets of the ADO units must be terminated with TR-72's.

4. If the All-Band Amplifier output is run directly to the ADO units (as in Fig. 20) two ADO-10, or six ADO-3 units may be connected in the line. If a 1502 line splitter is utilized, Fig. 19, one ADO-10, or three ADO-3 units may be connected to each output of the 1502. If additional ADO outlets are required, the maximum allowable cable length (150' RG-59-U), must be decreased as follows: for each additional ADO-3—subtract 25', for each additional ADO-10—subtract 75'

TYPICAL LAYOUT FRINGE AREA (Less Than 500 Microvolts) (Alternate Method)

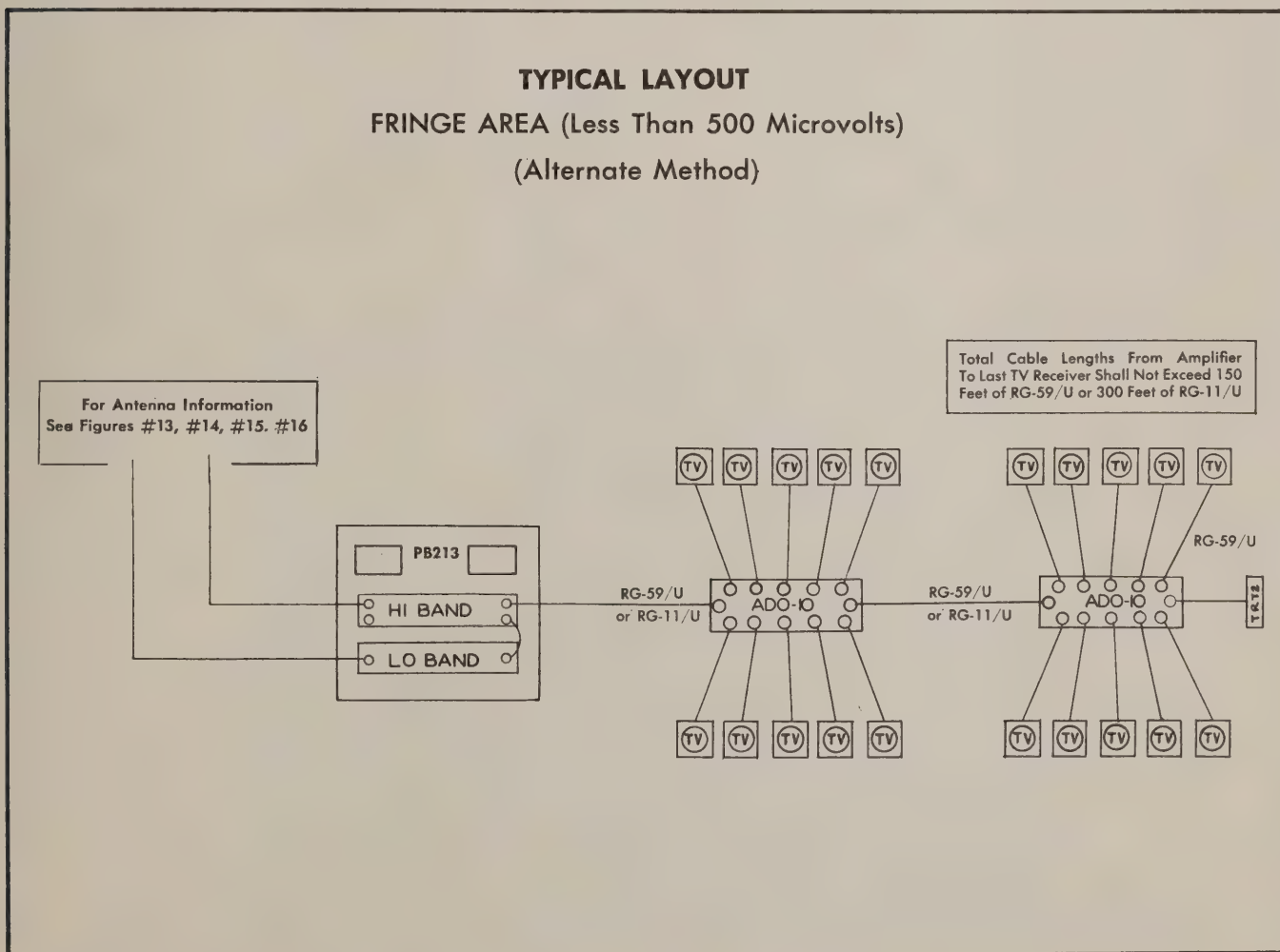


Figure 20
DEALER STORE, GARDEN-TYPE PROJECTS, APARTMENT HOUSES—WEAK SIGNAL AREA
(ALTERNATE METHOD)

MOUNTING EQUIPMENT ERECTION ANTENNAS

Antenna problems have been discussed in this manual as a guide to the selection of the proper type of antenna.

The physical erection of the antennas will, of course, be determined by the type of antennas employed, how high it is necessary to raise these antennas in order to obtain sufficient signal, and the type of building on which the antenna is being installed. Good antenna installation practices **MUST** be observed, with emphasis on the following points:

1. The mast must be thoroughly grounded with at least No. 8 ground wire which is run directly to a cold water pipe. (Never assume a vent or hot water pipe to be a good ground.)
2. The lead-in connection to the antenna should be covered with Jerrold Waterproof Compound, Type 2100.
3. Any screws on the antenna must be tight. Loose antennas can be a source of intermittent trouble.

LOCATING AMPLIFIERS

In weak signal areas, (under 500 microvolts) the amplifier should be located near the antennas. Convenient locations are in penthouses, elevator rooms, or outdoors, on the roof or tower, mounted in a weather-proof cabinet (Jerrold Model WC-300). It is important to keep the amplifier near the antennas, in weak signal areas, to provide maximum input signal to noise ratio.

In strong signal areas the amplifier may be located in any convenient spot, provided the cable losses do not reduce available input signals below rated. In dealers' store installations it generally will prove convenient to have the amplifier in an accessible location near the receivers.

MOUNTING AMPLIFIERS AND ADO UNITS

The amplifier and ADO units may be mounted in either a vertical or horizontal position. The equipment should be mounted so that it is convenient to service, but **NOT** accessible to building traffic. (It is recommended that the amplifier either be mounted in a ventilated cabinet or in some locked area to prevent tampering.) The amplifier and ADO units should be grounded to the electrical conduit system of the building, or to the antenna ground lead.

CABLE

In all installations coaxial cables are used for signal distribution. The cables may be pulled through conduit, building vents, hallways, elevator shafts, or may be run on building exteriors where necessary. Care should be taken in handling coaxial cable. It should not be bent sharply, run over rough edges, or subjected to extreme temperatures.

WIRING MULTI-UNIT APARTMENT BUILDINGS

The wiring of a multi-unit apartment building in a strong signal area can be accomplished by use of the 1401G or 1402G method of signal distribution in several ways.

INDOOR WIRING

1. *Where conduit is available*, it is most convenient to run RG 59/U riser cables through this conduit and install the 1402G isolation units in electrical outlet boxes in the apartments. In pulling this cable, it is recommended that a ten (10) inch loop be left in each box to facilitate installing the 1402G. The conduit boxes may then be locked with the Jerrold tamper-proof lock-plate assembly, and covered with a Jerrold 1402-P plastic plate.

2. *In Buildings with no conduit* provided for a Master Antenna System, the feeder cables from the ADO units are generally run down in elevator shafts, stairwells or through closets, and then along the hallways connecting the apartments. In the hallways, the RG 59/U cables are concealed beneath rugs or behind mouldings. The 1401G units are installed and connections to receivers made through a transom or living-room wall.

OUTDOOR WIRING. In installations where it is not practical to run cables inside the building, the RG 59/U cables may be run outdoors. Riser cables from the outputs of the ADO units are run, either in conduits along the roof, or in rings along the parapet of the roof to a point on the roof over the living room windows of the apartments. At this point, the cable is dropped over the roof and down the outside of the building, making certain that wherever the cable comes in contact with any part of the building, it is covered with tape or rubber hose to prevent abrasion.

The cable is clamped to the side of the building by means of cable clamps and made secure against wind-whipping. At each window a loop of about ten (10) inches is made and then taped back on the riser cable for neat appearance.

When making a connection, this loop is cut and a 1401G isolation unit inserted and covered with Jerrold Waterproof Compound, Type 2100. The 1401G bracket is screwed down into the window sill or under the sill ledge. The lead-in to the apartment is made with RG 59/U cable which is run through a quarter-inch hole drilled through the window casing.

TERMINATING RISER CABLES. It is imperative that every riser cable be terminated with a 72 ohm resistor. Therefore, the last isolation in a riser cable must always be the Jerrold 1401-T or 1402-T units. These latter units combine a 1401 with a Jerrold TR-72, Terminating Resistor.

CONNECTING RECEIVERS TO SYSTEM

The connection of a TV receiver may be made as follows:

1. In fringe area systems (See Figures No. 20 and No. 21), connection to a TV receiver is made directly from an outlet of the ADO unit by means of RG 59/U coaxial cable.

CAUTION

If an AC-DC, or a recent model TV set without an AC isolation transformer, is to be connected, use a 1201 Terminal Unit on the Baseboard or behind the set to provide antenna matching and also AC blocking. (See Appendix C for instructions on use of the 1201.)

2. In systems using 1401G, 1402G or 1404G Isolation Units (See Figures No. 18 and No. 19), connect the Isolation Unit to the riser cable with the C-52 connectors provided. Run RG 59/U from the Isolation Unit to the back antenna terminals of the TV receiver. Note precaution above for connecting AC-DC or transformerless receivers to system.

Direct pick-up problem in strong signal area: When a **Jerrold J-R** System is installed in the vicinity of a transmitter, and signal strengths of more than 5000 microvolts are on the antennas, the problem of direct pick-up exists. Direct pick-up is the signal picked up by the receivers themselves along the length of 300 ohm Twinex that connects the back antenna terminals of the receiver to the tuner of the TV set. The problem results from an out-of-phase condition between the direct pick-up signal and the signal received from the **Jerrold J-R** System outlet. It manifests itself as smear in the picture, leading ghost, multiple ghost, or unstable sync. If the signal from the transmitter is very strong, it is necessary to shield the cable between the antenna terminals and the

tuner in the TV set and in some cases to use a matching transformer (Jerrold Model TS-300).

Shielding may be accomplished in many ways:

a. In 72 ohm receivers, such as the Dumont, no change is necessary, as the receiver already has shielded cable inside.

b. In some models, such as RCA and Philco (prior to 1952), an elevator transformer is provided at the tuner. Arrange the connections on the transformer for 72 ohm match and substitute RG 59/U cable for the Twinex between antenna input terminals and tuner.

c. In receivers not providing for 72 ohm input: Unsolder the Twinex leads from the antenna terminals and slide a Jerrold Model L20 shielded loom over the Twinex. Resolder the shielded Twinex to the terminals at the back of the set (See Fig. 21). Ground the braid of this loom to the chassis at both ends—the tuner and at rear of chassis. Use RG 59/U to connect antenna terminals directly to the 1401G or 1402G Isolation Unit.

Another method of making the connection described above, is by use of Jerrold Matching Transformer and shielded lead assembly, Model No. TS-300. The Twinex is cut off as close to the tuner as possible, and the ATV-225 is soldered to the tuner terminals. RG 59/U cable is connected to the 72 ohm terminals of the transformer.

If there is any pick-up on the braid of the coaxial cable between the Isolation Unit and the TV set, it is necessary to ground this cable to the chassis. Cut away some of the vinyl jacket about a foot from the antenna terminals on the back of the TV set, and solder the braid directly to the chassis.

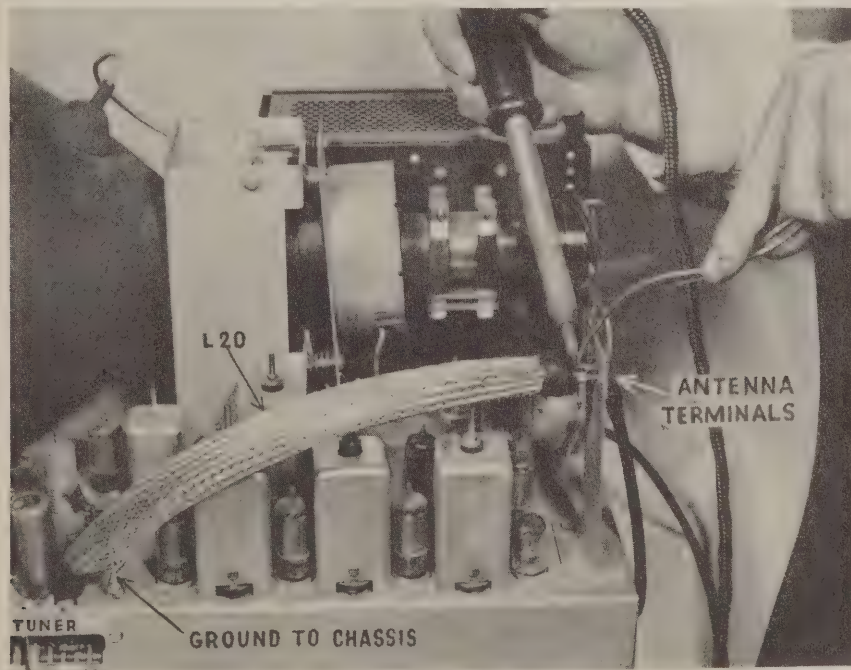


Figure 21
INSTALLING THE JERROLD SHIELDED LOOM
Model L20

NOTE: Chassis removed from cabinet for illustrative purposes.

BALANCING AND ADJUSTING SYSTEM

TEST EQUIPMENT

a. Volt-Ohmmeter for checking continuity of all antenna leads and co-ax cable. (Also, checking for 72 ohm termination.)

b. Jerrold Model A-72, Variable RF Attenuator. This is very useful for balancing the system and determining quickly the value of PD pads to insert in the amplifier input leads.

c. Accurate Field Strength Meter. The new, calibrated, direct-reading Jerrold Field Strength Meter, Model No. 704, permits accurate measurements ± 1 db from 10 microvolts to 3 volts. Continuous tuning over frequency range, 54 to 220 mc.

d. Television Receiver.

ORIENTING ANTENNAS

Antennas should be selected for maximum gain and minimum ghosts. Determine the type of antenna needed for the installation, then observe these instructions:

a. Check antenna lines for continuity with the Volt-Ohmmeter.

b. Connect the TV receiver to antenna.

c. Orient the antenna to obtain sharp, ghost-free pictures on each channel.

In extremely strong signal areas it will be necessary to shield the receiver being used, in order to prevent any direct pick-up in the receiver from interfering with the antenna signals being observed.

AMN NETWORKS

These units are used when individual antennas are needed for each channel. They are constructed to fit "piggy-back" on their respective amplifier strips. This assembly is shown in Figure 3 for the AMN-Lo and is similar for the AMN-Hi.

Connect the coaxial transmission lines from the individual channel antennas to the proper fittings marked "antenna inputs." Terminate all unused *input* fittings of the AMN with Jerrold TR-72, Terminating Resistors.

Connect the output of the AMN to the input of the proper amplifier. Use a piece of RG 59/U about a foot in length. (The High Band Strip has two input connectors; either may be used for connecting the AMN-Hi. *Leave the other fitting unterminated.*)

Note

All fittings on the AMN units are designed for use with RG 59/U coaxial cable. If RG 11/U is used, cable adapters Model C-101 are available for adapting RG 11/U to RG 59/U.

There are three adjustment slugs for each channel. They are marked: Primary (PRI), Coupling (COUP), and Secondary (SEC).

The Coupling adjustment is prealigned and locked in the factory—do not tamper with it.

To adjust the Primary and Secondary slugs, connect the AMN output to either a field strength meter or a television set (preferably one without AGC). Each unused AMN input *must* be terminated with a TR-72.

When using a field strength meter, tune the primary and secondary slugs for a maximum reading on picture carrier. If a TV receiver is used, the receiver input should be padded with a 30 db pad (PD-30) so that the peak adjustment of the AMN may be detected easily by improvement in the picture quality. If the TV test receiver has AGC, it is suggested that the AGC be disabled.

Where a TV sweep generator and oscilloscope are available, the AMN units may be tuned precisely by adjusting each Primary and Secondary for a flat top response (6 mc wide over the TV channel). The sweep generator is connected to the AMN input; the AMN output is connected to the Broad Band amplifier input, and the Broad Band amplifier output to the scope.

IMPORTANT

1. When using the AMN-Hi in Channel 8, 10, and 12 areas, the unused antenna input on the AMN-Hi (the "12-13" fitting) must be tuned away from Channel 12. This is accomplished by tuning the slugs all the way *out*, away from the metalwork.

2. Tune each unused adjustment to make certain that it is not interfering with the channels being received. Unused positions may be used as absorption traps, if necessary, to minimize adjacent channel or RF beat interference.

AMPLIFIERS

When balancing the system, the test equipment should be arranged and connected as shown in Figure 22. First, the highest channel antenna is connected to the AMN-Hi (all other input terminals on the AMN must be terminated in TR-72's). The Test Receiver is tuned to the proper channel and the fine tuning control rotated on either side of maximum sound. If a 60 cps buzz is heard, the amplifier is overloaded. Switch in sufficient attenuation into the Model A-72 until this buzz is eliminated; record the amount of attenuation required, and replace the Model A-72 with a fixed attenuator (PD) Pad, at least 6 db more in value.

Proceed by connecting the next highest channel. If cross-modulation (frames sliding across picture, or severe beat pattern) is observed on either of the two channels connected, add sufficient attenuation into the antenna line of the offending channel to eliminate it.

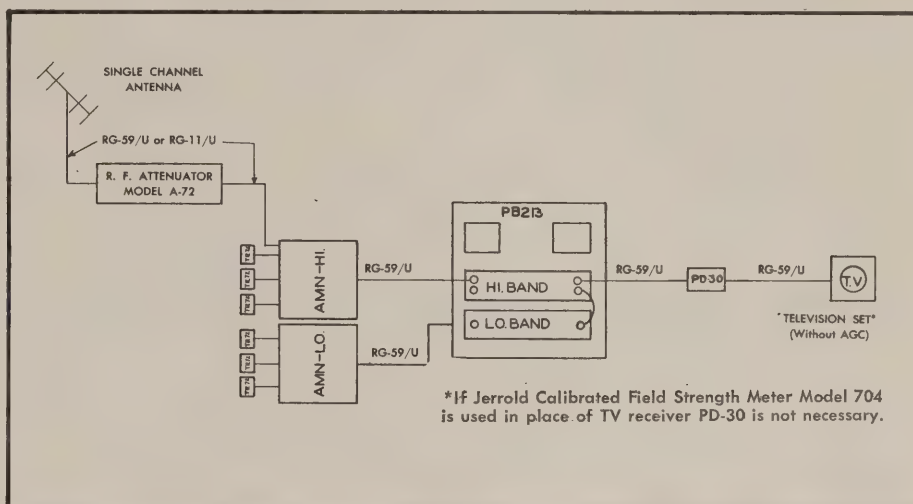
After all the antennas are connected and adjusted, any remaining interference due to cross-modulation may be located by disconnecting the antenna which appears to have the strongest signal and observing the effect on interference. If this channel is the offender, attenuate it sufficiently with "PD" Pads to remedy the situation. (Remember that it only takes one strong signal that exceeds the Rated Maximum Input to overload the output tube of the amplifier and cause interference and cross-

modulation on all channels on that strip.)

Note

With a good, calibrated Field Strength Meter and a model A-72 Attenuator, it is possible to set all input levels properly if sufficient antenna signal is available. Any subsequent raising or lowering of the levels may be done while observing the amplifier outputs on a TV receiver.

Figure 22
TEST SET-UP FOR
BALANCING AMPLIFIER



MAINTENANCE PROBLEMS

If trouble occurs after the system is in operation, check as follows:

1. NO SIGNAL FROM AMPLIFIER

- Check fittings of amplifier and cables.
- Disconnect inputs to amplifier and measure antenna signals. If O.K., then trouble is in amplifier.
- Remove fuse cover plate on power supply and check fuses.
- Check tubes of amplifiers. Replace one tube at a time; reinsert original tube if good. If anything other than tubes has failed in either the High Band or the Low Band Strip, it is recommended that these strips be returned to Jerrold Electronics Corp., Philadelphia 46, Pa., or to the Jerrold Distributor for repair.

2. NO SIGNAL FROM ADO

If there is a signal out of the amplifier but not from the ADO, then check ADO unit for bad fittings, bad tubes, etc.

3. LOSS OF ONE CHANNEL

Check the antenna and the AMN-Hi or AMN-Lo unit. This trouble cannot be due to the amplifier. If the AMN unit is found to be defective, suspect an open lead inside the unit.

4. CROSS MODULATION

This is due to unbalance of the signal inputs to the amplifier. See Section on Balancing and Adjusting System.

5. GHOSTS

Ghost images in a master antenna system may be caused by:

- Antenna pick-up of reflections.* This can only be overcome by proper selection and orientation of antennas.
- Improper termination of cables.* Check all cables to make certain they are terminated properly with a Jerrold TR-72 Terminator. Also check all fittings and splices to make certain they are made properly.
- Direct pick-up of signal by receiver.* This condition usually shows up as a "leading white" type of ghost. It is caused by the receiver picking up signals coming through the window, in addition to receiving the desired signals coming through the system. The receiver must be thoroughly shielded. Connection from the 1401, 1402 or 1404 outlet of the antenna system *must* be by means of co-ax cable and this must be connected directly to the tuner of the receiver using a matching transformer if needed. See Section on Connecting Receivers to System, page 17.

SERVICING

Qualified technicians can service the **Jerrold J-R** equipment readily with proper test equipment.

The mixing networks, receiver isolation networks, PD pads, etc., rarely cause any trouble. If inoperative, check for open leads, loose fittings, or any mechanical defects.

Schematics and instructions furnished with the ADO units will facilitate servicing these units.

The All-Band Amplifiers employ newly designed stagger-tuned, overcoupled, broad band circuits. The voltage charts given here are an aid in locating defective components.

Alignment of these strips is quite critical and requires special sweep equipment, such as extremely wide band sweep generators. Therefore no attempt should be made in the field to change or tune the coils, unless equipment to do the job is available. Amplifier strips, which cannot be easily repaired in the field should be returned to Jerrold for replacement or repair.

Figure 23 shows the test equipment used by Jerrold to align the All-Band Amplifier. Note the extra wide sweep generators (50 MC low band, and 60 MC high band) necessary for proper alignment.

LOW BAND AMPLIFIER, B-26

PIN	1	2	3	4	5	6	7	8	9
TUBE									
V1	145		1.5		6.3 AC	145		1.5	
V2		2.7		6.3 AC	145	145		—	—
V3		2.7		6.3 AC	145	145		—	—
V4		2.7		6.3 AC	145	145		—	—

HIGH BAND AMPLIFIER, B-713

PIN	1	2	3	4	5	6	7	8	9
TUBE									
V1	145		1.5		6.3 AC	145		1.5	
V2		2.7		6.3 AC	145	145		—	—
V3		2.7		6.3 AC	145	145		—	—
V4		2.7		6.3 AC	145	145		—	—
V5		2.7		6.3 AC	145	145		—	—

All voltages are DC and measured to ground unless otherwise specified, using a 20,000 ohm/volt meter.

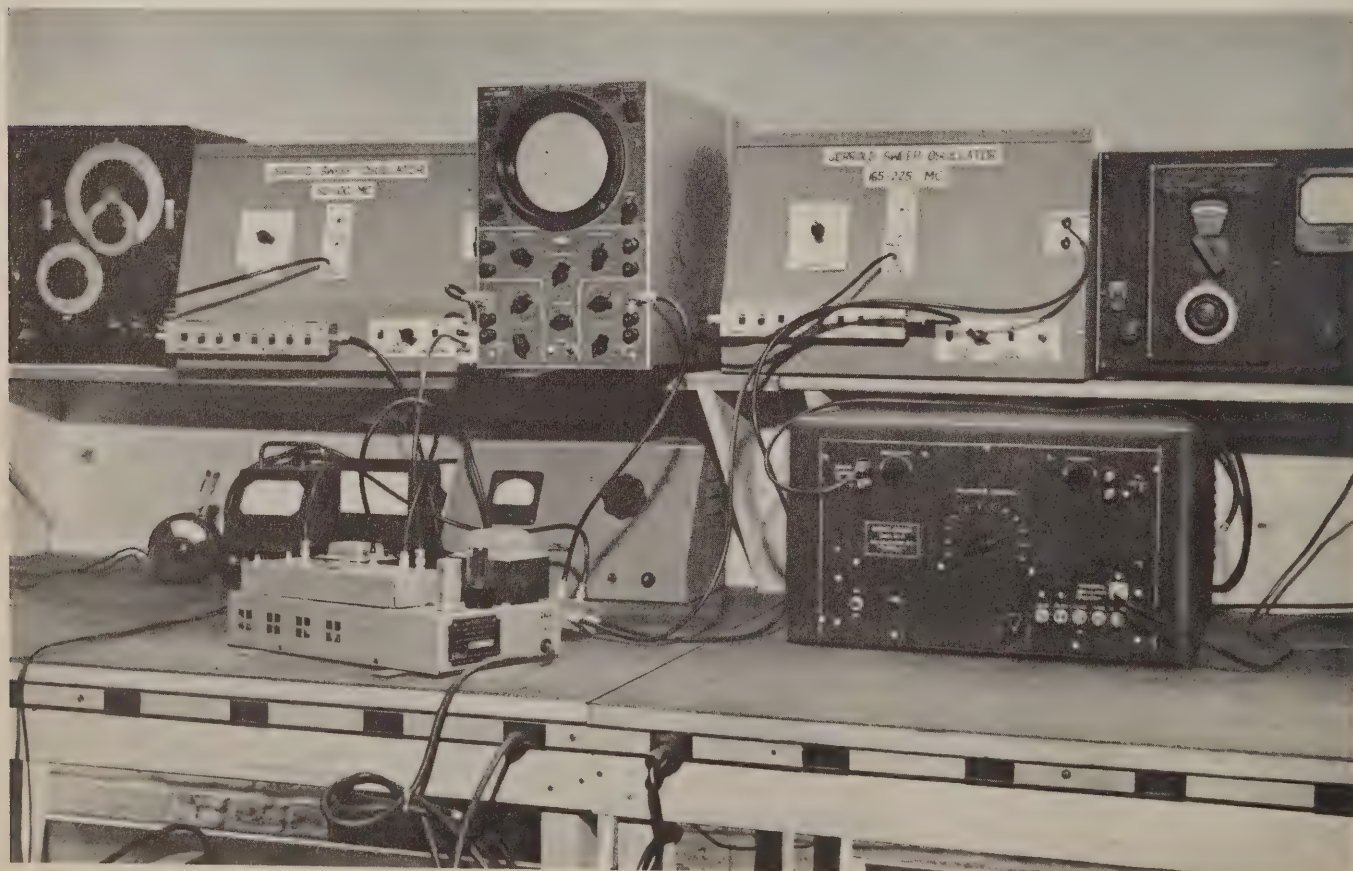


Figure 23

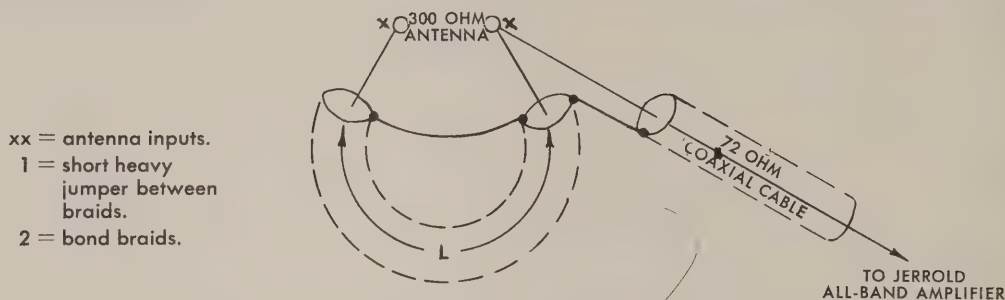
Production set up at Jerrold for aligning Broad Band Amplifiers

APPENDIX A

CONSTRUCTING BALUNS

When connecting a 300 ohm single channel antenna to the **Jerrold J-R** System, RG 59/U or RG 11/U (72 ohms) coaxial cable must be used.

An effective method of matching the cable to the antenna is by using the $\frac{1}{2}$ wavelength balun, as shown below.



Channel	2	3	4	5	6	7	8	9	10	11	12	13
"L" in inches	68½	61⅞	56½	49¾	45⅞	22	21¼	20⅞	20	19¾	18⅞	18¼

APPENDIX B

ELIMINATING INTERFERENCE

A simple method of attenuating or trapping out FM and Code interference is the use of one-quarter ($\frac{1}{4}$) wavelength open stubs.

The stub is inserted at the input of the receiver or amplifier by means of a "T" connector, Jerrold Model C-41.

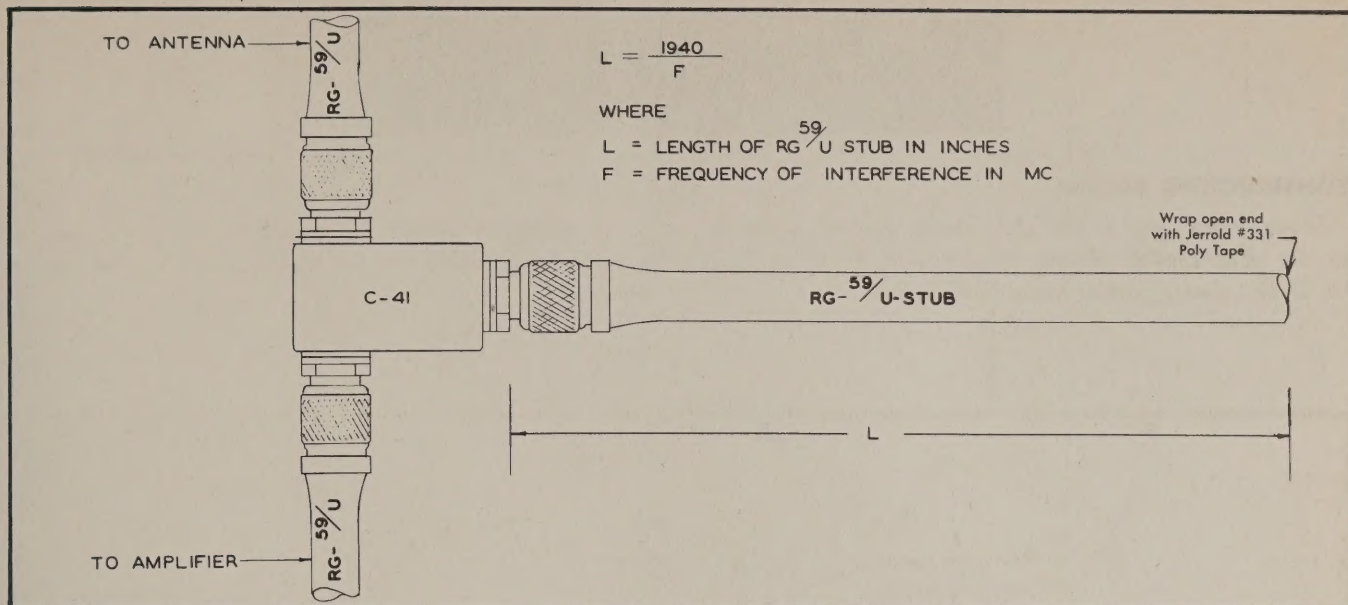
The length of the stub is given by the formula below. It is best to start with the stub a few inches longer than the calculated value and make the final cut under actual test conditions. Connect a TV receiver to the output of the amplifier, making certain to pad the output sufficiently so as not to overload the receiver. Insert the C-41 into the cable between the antenna and amplifier; attach the stub with a cable connector to the C-41. Cut small amounts of the stub until maximum trapping of the interfering signal occurs.

After the proper stub length has been determined (make certain that the open end is cut cleanly), wrap the open end with Bishop Poly Tape—Jerrold Item No. 331. The stub may then be coiled and left in position without detuning effects.

IMPORTANT

A stub trap is effective when the interfering signal exists one megacycle or more below the video carrier, or one megacycle or more above the sound carrier of the channel to be received.

For adjacent channel interference less than one megacycle from either carrier, a special trap may be necessary. Consult with the Jerrold Service Corporation, Phila., Pa., for information and help in your interference problems. Special traps are available from Jerrold.



APPENDIX C

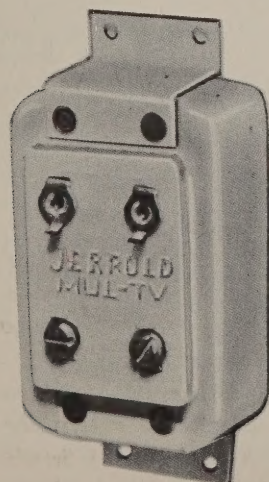
CONNECTING TRANSFORMERLESS (AC-DC) RECEIVERS TO SYSTEM

The chassis of "AC-DC" television sets must not be connected directly to the co-ax braid, or the ground side of the **Jerrold J-R** System. To do so might result in damage to the set, the system, or other sets on the system.

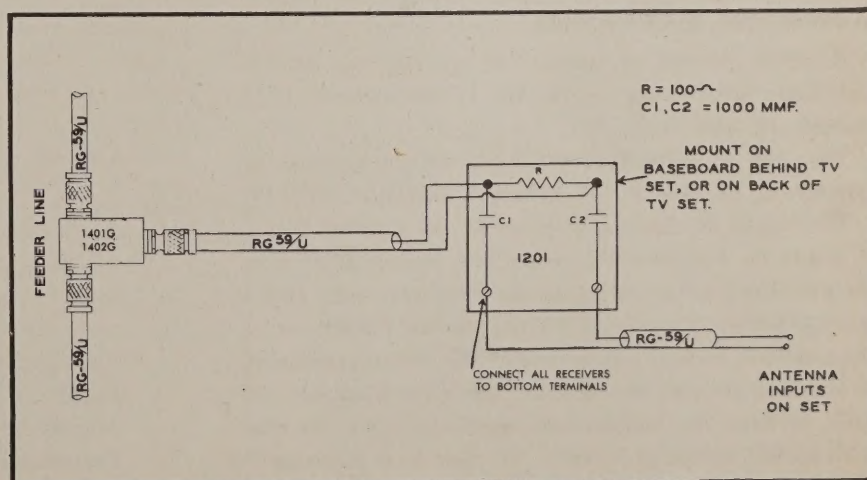
The correct method of connecting AC-DC sets, both 72 ohm and 300 ohm is shown above.

Note

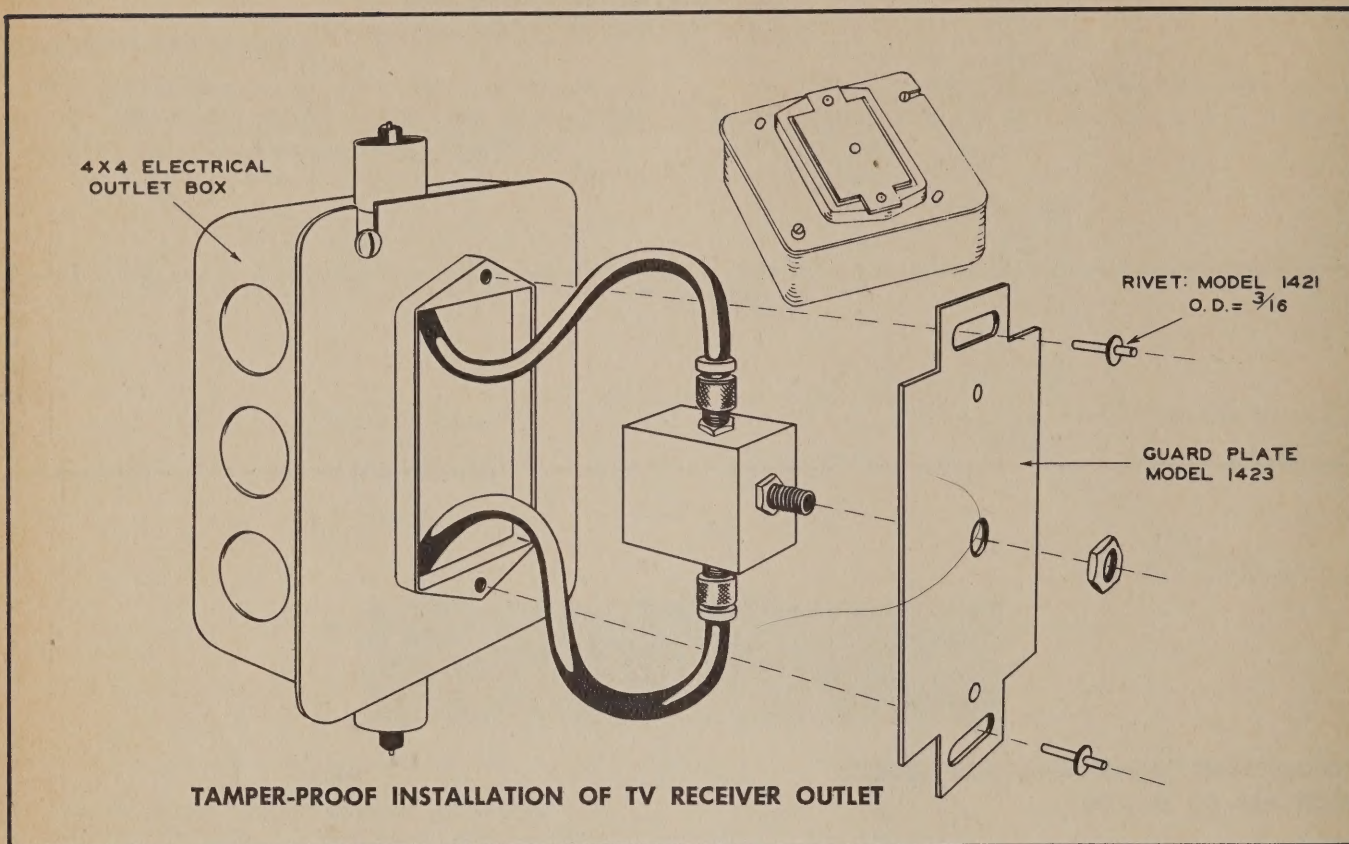
1. Co-ax is run from the isolation unit to a 1201 located on the baseboard, or behind the set. The co-ax should be grounded to the upper posts on the back of the 1201 marked, "solder cable here."
2. Connection to an AC-DC set, whether it is 72 ohm or 300 ohm is made from the lower screw terminals of the 1201 (marked 300 ohm). This connection must be made with co-ax. Use of twin lead will result in noise pickup.



Model 1201
WALL TERMINAL UNIT



APPENDIX D



INSTALLING A 1402-G RECEIVER ISOLATION UNIT

To effect a tamper-proof installation of your Jerrold receiver isolation unit, Model 1402G, follow these instructions carefully:

INITIAL INSTALLATION:

1. When co-ax risers are pulled, leave approximately ten (10) inches of cable slack looped in each electrical outlet box.

2. Connect the isolation network into the riser cable with the C-52 fittings provided. Leave some slack in making the connection and lay the isolation network in the outlet box. The nut should be threaded on the unit along with the extra ferrule and C-52 fitting.

3. Enlarge holes at top and bottom of the outlet box plaster cover with a No. 5 drill. The enlarged holes will accommodate the $\frac{3}{16}$ " blind rivets, Model 1421.

4. Place guard plate over the plaster cover and push the rivets through. Tap the rivet pins lightly with a hammer until the pins are flush with the rivets. *A Tamper-proof assembly has now been completed.*

Note

If a tamper-proof installation is NOT desired,

then install the guard plate with the screws provided. In this case, do not drill the holes in the plaster cover.

5. Cover the outlet with a Jerrold plastic cover plate, Model 1402-P.

MAKING THE CONNECTION TO A RECEIVER:

1. Remove 1402-P cover plate.

2. Remove rivets by drilling them out; or knock out the rivet center pins with a punch, and pry out the rivets with a straight edge. (Be careful not to chip plaster.)

3. Remove the nut from the C-61 and insert the isolation network through the center hole in the guard plate. Fasten the assembly with the nut.

4. Install two new Model 1421 rivets in the guard plates. These rivets may be procured from the Jerrold Distributor.

Note

If risers are to be pulled with loops, and 1402G isolation networks installed in the cable at a later date, the Jerrold guard plate assembly, Model 1423 (with two rivets) may be used to protect the riser cable itself from tampering.

WARRANTY

The **Jerrold J-R** EQUIPMENT is guaranteed to be free from any defects in workmanship and material.

This warranty shall hold for ninety (90) days from the date of shipment. Any equipment that fails in service during this period should be returned to the factory, transportation charges prepaid, for repair or replacement.

This warranty shall not apply if the Jerrold equipment has been repaired or in any way altered outside our factory, or if it has been subject to mis-use, negligence or accident, or if the serial number has been altered, defaced, or removed.

A system comprises both installation and equipment. The Jerrold equipment is the finest on the market and its performance is GUARANTEED. In this manual Jerrold has furnished instructions for engineering the layout of a system and for making proper installation.

Jerrold condones no short-cuts in installing a system. It is important, to assure proper operation, that the entire system be installed only with Jerrold equipment—amplifiers, ADO units, isolation networks, and other accessories, as specified.

Jerrold can assume no responsibility for the performance of a system that is not installed properly, or where equipment of other manufacturers, other than antennas and cable, is used in the system. Only by using Jerrold equipment throughout the system can the proper results be achieved.

JERROLD PIONEERS AGAIN!

1948

JERROLD produced the first all-channel TV antenna signal booster, and brought clear television reception to thousands of fringe area dwellers.

1949

JERROLD introduced the now famous Mul-TV System—the first successful Master Antenna Distribution System for TV dealers and department stores. Over 2500 dealers from coast-to-coast are now using the Jerrold Mul-TV System in their display rooms to increase their TV set sales.

1950

JERROLD perfected the first successful Master Antenna System for apartment houses, hospitals, and hotels. The Jerrold Mul-TV Master Antenna System enables thousands upon thousands of apartment house and hotel tenants in all major cities to enjoy ghost-free, clear television reception.

1951

JERROLD introduced the most sensational development in television since advent of the Cathode Ray Tube—THE JERROLD COMMUNITY ANTENNA SYSTEM: bringing clear snow-free pictures to countless thousands of families living in extreme fringe or "hidden" fringe areas.

and now



1952

JERROLD presents the most economical Master Antenna System for projects from 2 to 48 units—the *Jerrold J-R* SYSTEM.